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A Tough Winter for Bean Leaf Beetle

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Abstract
Bean leaf beetle adults (Photo 1) are susceptible to cold weather and most will die when air temperatures fall below 14°F (-10°C). However, they have adapted to winter by protecting themselves under plant debris and loose soil. Each spring, adult beetles emerge from overwintering habitat and migrate to available hosts, such as alfalfa, tick trefoil, and various clovers. As the season progresses, bean leaf beetles move to preferred hosts, like soybean. While initial adult activity can begin before soybean emergence, peak abundance often coincides with early-vegetative soybean.

Disciplines
Agricultural Science | Agriculture

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Extension and Outreach

Integrated Crop Management

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Photo 1. Adult bean leaf beetle. Photo by Winston Beck.

An overwintering survival model developed by Lam and Pedigo from Iowa State University in 2000 is helpful for predicting winter mortality based on accumulated subfreezing temperatures. Predicted mortality rates in Iowa for the 2017-2018 winter range from 64-97 percent (Figure 1). Northern Iowa experienced colder temperatures and most bean leaf beetle adults are not expected to survive (mortality ranging from 89-97 percent).

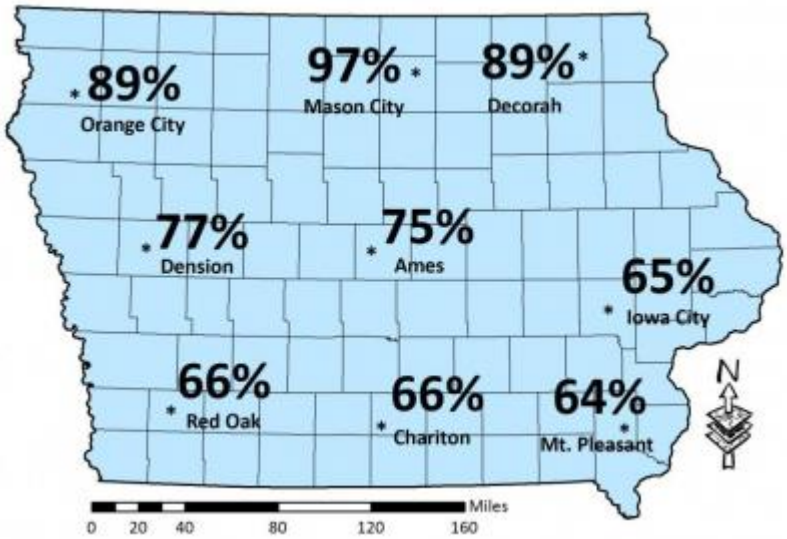

Figure 1. Predicted overwintering mortality of bean leaf beetle based on accumulated subfreezing temperatures during the winter (1 October 2017 – April 2018).

The statewide-predicted mortality from the 2013-2014 winter was the highest since Marlin Rice started tracking these data in 1989. The 2015-2016 and 2016-2017 winters were milder compared to the 2017-2018 winter. Last winter, the predicted mortality of bean leaf beetle in central Iowa was 75 percent, which is slightly higher than the 29-year average of 71 percent (Figure 2). It is important to remember insulating snow cover and crop residue can help protect bean leaf beetle from harsh air temperatures. Fluctuating temperatures can negatively influence spring populations.

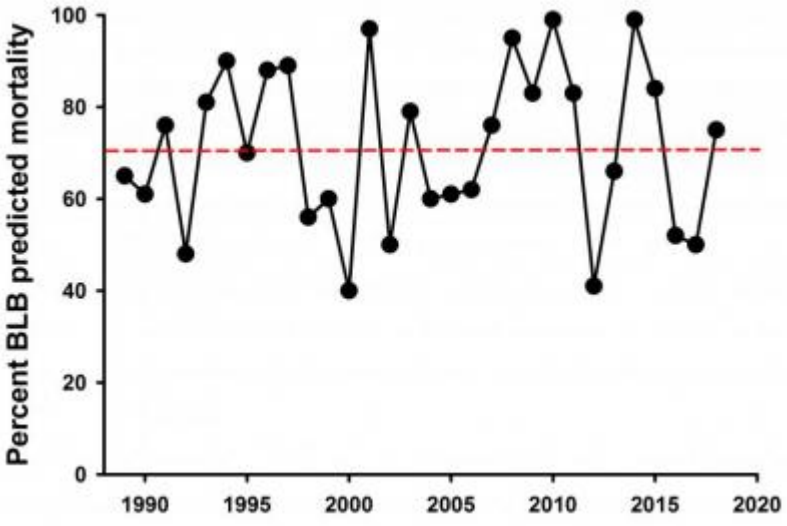

Figure 2. Predicted bean leaf beetle mortality by year for central Iowa; the

red line indicates the average mortality rate (71 percent).

Overwintering beetles moving to crops are expected to be low this year; however, consider scouting soybean fields, especially in southern Iowa, if:

1. Soybean is planted near alfalfa fields or if the field has the first-emerging soybean in the area. Overwintering adults are strongly attracted to soybean and will move into fields with emerging plants.
2. Fields have a history of bean pod mottle virus.
3. Food-grade or seed fields where reductions in seed quality from bean pod mottle virus can be significant.

Bean leaf beetles are easily disturbed and will drop from plants and seek shelter in soil cracks or under debris. Sampling early in the season requires you to be "sneaky" to estimate actual densities. Although overwintering beetles rarely cause economic damage, their presence may be an indicator of building first and second generations later in the season. More details information about bean leaf beetle and bean pod mottle virus are available.

Category: Crop Production Insects and Mites

Crops:

Soybean Biomass and Forage

Tags: pest scouting mortality IPM

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